



Subject card

Subject name and code	Fundamentals of new material technologies, PG_00053712						
Field of study	Mechanical Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
Education level	first-cycle studies		Subject group				
Mode of study	Full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		English		
Semester of study	6		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute Of Manufacturing And Materials Technology -> Faculty Of Mechanical Engineering And Ship Technology -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Dionizy Czekaj				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		0.0		0.0	30
Subject objectives	To explain students some key issues in the field of Materials Science and Engineering						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W12] possesses basic knowledge necessary to understand the ex-technical conditions of engineering activity, possesses basic knowledge on management, including quality management and running commercial enterprise, within the range of protection of intellectual property and patent law; knows general principles of creating and developing forms of individual entrepreneurship and basic HSE rules applicable to machine industry		The student has general knowledge in the field of intellectual property protection.		[SW1] Assessment of factual knowledge		
	K6_W03		The student has knowledge on structural materials as well as methods of investigation their properties		[SW1] Assessment of factual knowledge		
	K6_U01		Student can find source information with the use of library catalogs - analog and digital. Student is able to critically analyze the usefulness of the obtained data for the implementation of a selected engineering problem.		[SU2] Assessment of ability to analyse information		
	K6_U10		The student is able to make a general selection of the material intended for use in the solution of a specific engineering project.		[SU2] Assessment of ability to analyse information		
Subject contents	1. Ceramics and glass. 2. Modern (advanced) ceramic materials; 3. Refractory materials. 4. Ceramic abrasives; 5. Glass and glass-ceramics.						

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquium (written paper)	51.0%	50.0%
	Project Report	100.0%	50.0%
Recommended reading	Basic literature	1. W.D. Callister, Jr., Materials Science And Engineering, An Introduction, 7th ed., Wiley, 2007, 2. M.F. Ashby and D. R. H. Jones, Engineering Materials 1, 3rd ed., Elsevier Butterworth Heinemann, 2006, 3. M.F. Ashby, H.R. Shercliff, D. Cebon, Materials: Engineering, Science, Processing And Design, Butterworth Heinemann, 2007, 4. W. Bolton, Materials for Engineering, Routledge, Taylor & Francis Group, NY, 2011. 5. Michael F. Ashby, Paulo J. Ferreira and Daniel L. Schodek; Nanomaterials, Nanotechnologies and Design; Elsevier, 2009 6. Donglu Shi, Zizheng Guo and Nicholas Bedford; Nanomaterials and Devices; Elsevier, 2015 7. Bangwei Hang; Physical Fundamentals of Nanomaterials; Elsevier, 2018 8. Kelsall R.W., Haley J.W., Geghegan M (Eds.), Nanoscale Science and Technology, John Wiley & Sons Ltd 9. DeGarmos MATERIALS AND PROCESSES IN MANUFACTURING, J T. Black, Ronald A. Kohser, John Wiley 10. Mikell P. Groover, Fundamentals of Modern Manufacturing Materials, Processes, and Systems, Fifth Edition, John Wiley, 2013	
	Supplementary literature	1. A.J. Moulson, J.M. Herbert, Electroceramics, Materials Properties and Applications, Chapman and Hall, 1990 2. M. Blicharski., Wstęp do inżynierii materiałowej, Wydawnictwo Naukowo Techniczne, Warszawa 2001 3. M. Blicharski, Inżynieria materiałowa, Wydawnictwo Naukowo Techniczne, Warszawa 2014; 4. M. Blicharski, Inżynieria materiałowa. Stal, Wydawnictwo Naukowo Techniczne, Warszawa 2017; 5. M. Blicharski, Inżynieria powierzchni, Wydawnictwo Naukowo Techniczne, Warszawa 2019; 6. M. Kaczorowski, A. Krzyńska, Konstrukcyjne materiały metalowe, ceramiczne i kompozytowe, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2017 7. L.A. Dobrzański , Podstawy nauki o materiałach i metaloznawstwo. Materiały inżynierskie z podstawami projektowania materiałowego., WNT Warszawa, 2002 8. M. Ashby, H. Shercliff, D. Cebon, Inżynieria materiałowa, T1, T2, Wydawnictwo Galaktyka, Łódź, 2011 9. M. Głowacka, J. Łabanowski, Inżynieria powierzchni. Wybrane zagadnienia. Wydawnictwo PWSZ w Elblągu, Elbląg 2014 10. M. Głowacka, A. Zieliński, (Red.) Podstawy metaloznawstwa, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2011 (skrypt). 11. M. Głowacka (Red), Metaloznawstwo, Wydawnictwo Politechniki Gdańskiej, Gdańsk 1996 (skrypt) 12. J. Hucińska (Red), Metaloznawstwo. Materiały do ćwiczeń laboratoryjnych, Wydawnictwo Politechniki Gdańskiej, Gdańsk 1995(skrypt).	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	1. Structure of advanced ceramic materials 2. Technology of advanced ceramics 3. Glass and glass-ceramics		
Work placement	Not applicable		

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